



**Bibliography of  
Reports and Journal Articles  
Approved for Public Release:  
FY 89**

AD-A220 015

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**Bibliography of  
Reports and Journal Articles  
Approved for Public Release:  
FY89**

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San Diego, California 92152-6800

# REPORT DOCUMENTATION PAGE

Form Approved  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

|  |  |   |   |  |  |
|--|--|---|---|--|--|
| 1. AGENCY USE ONLY (Leave blank)   |  | 2. REPORT DATE<br>February 1990                         |   | 3. REPORT TYPE AND DATE COVERED<br>Administrative Publication--Oct 88-Oct 89 |  |
| 4. TITLE AND SUBTITLE<br>Bibliography of Reports and Journal Articles Approved for Public Release:<br>FY89   |  |   |   | 5. FUNDING NUMBERS   |  |
| 6. AUTHOR(S)<br>Dalton, Rachel G.  |  |   |   |  |  |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)<br>Navy Personnel Research and Development Center<br>San Diego, California 92152-6800   |  |   |   | 8. PERFORMING ORGANIZATION<br>REPORT NUMBER<br>NPRDC-AP-90-4                 |  |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)  |  |   |   | 10. SPONSORING/MONITORING<br>AGENCY REPORT NUMBER                            |  |
| 11. SUPPLEMENTARY NOTES  |  |   |   |  |  |
| 12a. DISTRIBUTION/AVAILABILITY STATEMENT<br>Approved for public release; distribution is unlimited.  |  |   |   | 12b. DISTRIBUTION CODE   |  |
| 13. ABSTRACT (Maximum 200 words)<br>This reports lists all technical reports, journal articles, administrative publications, and technical notes that have been approved for public release in FY89. Publications in each category are listed in chronological order under the following areas: manpower, personnel, testing systems, education and training, organizational systems, administrative publications. |  |   |   |  |  |
| 14. SUBJECT TERMS  |  |   |   | 15. NUMBER OF PAGES<br>65  |  |
|  |  |   |   | 16. PRICE CODE   |  |
| 17. SECURITY CLASSIFICATION OF REPORT<br>UNCLASSIFIED  | 18. SECURITY CLASSIFICATION OF THIS PAGE<br>UNCLASSIFIED | 19. SECURITY CLASSIFICATION OF ABSTRACT<br>UNCLASSIFIED | 20. LIMITATION OF ABSTRACT<br>UNLIMITED |  |  |

## Foreword

This report contains an abstract of all reports and journal articles that were prepared by NPRDC personnel and published and approved for public release in FY89.

Publications are listed in chronological order under six areas: Manpower, Personnel, Testing System, Education and Training, Organizational Systems, and Administrative Publications.

Some publications overlap subject-matter areas and accordingly are listed in more than one area.

Qualified users may request copies of publications from the Defense Technical Information Center (DTIC), Cameron Station, Alexandria, Virginia 22314 (Telephone: Commercial (202) 274-7633 or Autovon 284-7633). General public may order from the National Technical Information Service, Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161 (Telephone: Commercial (703) 487-4650 (no Autovon)).

B. E. BACON  
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| DTIC TAB           | <input type="checkbox"/>                   |
| Unannounced        | <input type="checkbox"/>                   |
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| Dist               | Avail and/or<br>Special                    |
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**Empower**

**Technical Report**

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**TR 89-5  
January 1989  
(AD-A206 089)**

S. J. Pinciario

***The Development and Implementation of the Budget  
obligation Analysis and Tracking System (BOATS)***

**Approved for public release; distribution is unlimited.**

The pays and allowances components of the Navy's military personnel appropriation (MPN) now exceed \$17 billion/year. To manage and monitor these budget items, large volumes of data must be assembled, analyzed, and tracked monthly. These data are used to estimate the Navy's year-to-date obligations for military pays and allowances, including those which may not yet be reported due to lags in the financial accounting system.

Estimated obligations are compared each month to planned monthly obligation levels to monitor MPN budget execution. Significant discrepancies indicate that corrective actions are needed to stay within budget.

The Navy has been manually performing the data maintenance and statistical analyses required to manage and monitor MPN budget execution. Problems in MPN budget management have been traced to the limitations of these manual methods.

BOATS automates and streamlines MPN budget management processes. Implemented in stages throughout FY84-86, BOATS represents a significant advance in the Navy's MPN budget management capability.

## Technical Notes

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**TN 89-1**  
**October 1988**  
**(AD-A199 771)**

B. Medearis  
M. Shoecraft

***Models for Estimating Research and Development  
Manpower in Navy Laboratories***

**Approved for public release; distribution is unlimited.**

This report describes the development and implementation of models that project scientist, engineer, and technician (SE&T) staffing levels at each of the Commander, Space and Naval Warfare Systems Command research and development (R&D) centers by type of funds and product area, given specific funding levels and in-house/contract mixes. The model can also be used to evaluate the impacts of personnel ceiling and in-house dollar expenditure limits. The results should be of interest to defense R&D managers concerned with matching workload with work force.

**TN 89-14**  
**February 1989**  
**(Also listed under Personnel.)**

R. E. Chatfield  
S. A. Gullett

***Development of a USMC Assignment Decision Support  
System: Feasibility Study***

**Approved for public release; distribution is unlimited.**

Four alternative approaches to development of an Officer Assignment Decision Support System (OADSS) to improve current methods of officer assignment in the United States Marine Corps were evaluated. This feasibility study examined both the operational and technical feasibility of the four alternatives and considered such factors as hardware, software, and communications. Both Existing System Enhancement and Distribution Processing--Microcomputer alternatives were deemed feasible but the former has a more favorable cost-benefits ratio, better in-house system support and will expedite system implementation. However, it is recommended that an economic analysis be conducted to further evaluate the two feasible alternatives.

## Technical Notes

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**TN 89-26**  
**June 1989**  
**(AD-A209 871)**

L. Norton

***A Compendium of Navy and Marine Corps Decision  
Support Systems for Military Personnel Planning and  
Operations***

**Approved for public release; distribution is unlimited.**

This report describes decision support systems developed during the period 1966 to 1989 by the Manpower Systems Department at the NPRDC. The descriptions encompass various models, techniques, data bases, or systems used by Navy and Marine Corps manpower and personnel planners in managing its human resources. For each decision support system listed, there is a brief description of the operational problem, the nature of the R&D product, its use and by whom, and references to published documents describing the work. The descriptions are arranged in eight categories, according to the use of the end product. These categories consist of (1) manpower management, (2) enlisted force management, (3) officer force management, (4) civilian personnel systems, (5) recruiting and manpower supply, (6) personnel distribution and assignment, (7) costing, compensation, and budget management, and (8) information delivery systems.

**TN 89-29**  
**August 1989**  
**(AD-A213 235)**

R. M. Holmes  
C. Pabiniak

***Forecasting PCS ORT Moves Using Tree Classifications***

**Approved for public release; distribution is unlimited.**

This report describes a simple, objective method to produce permanent change of station (PCS) move forecasts for use in budget development and execution. The forecasts are produced, using a technique called tree classification, at levels of detail sufficient to develop the military personnel Navy (MPN) budget and to monitor budget execution. The forecasts are based on simple, known assumptions and provide an objective estimate of future PCS moves.



## Technical Notes

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**TN 89-32**  
**August 1989**  
**(AD-A213 310)**  
**(Also listed under Personnel.)**

R. E. Chatfield  
S. A. Gullett

***Development of a USMC Officer Assignment Decision Support System: Functional Description***

**Approved for public release; distribution is unlimited.**

This functional description was completed as part of the life cycle management process for development of an Officer Assignment Decision Support System (OADSS). The document provides information about system performance requirements, preliminary design considerations, and end-user impacts attributable to system implementation. Existing methods of officer assignment are summarized and proposed improvements are detailed. System benefits are grouped into four categories: functional improvements, improvements of degree, timeliness, and elimination/reduction of existing capabilities no longer required. Details pertaining to system input/output, data bases, failure contingencies, and security are also provided. It is recommended that a Data Requirements Document be completed as the next phase in development of OADSS.

**TN 89-35**  
**September 1989**

J. P. Boyle  
C. Mullins

***Improving Marine Corps Enlisted Personnel Loss Forecasting***

**Approved for public release; distribution is unlimited.**

This report describes the development of a model to forecast End of Active Service and non-End of Active Service losses. A validation study was conducted comparing the forecasts generated by the current method and forecasts generated by the method described in this report with actual FY87 losses. The Linear Exponential Smoothing method outperformed the current method in producing 1-year ahead forecasts at the pay grade and year of service level of detail. Further research will explore other model specifications including multivariate and econometric techniques.

## Technical Notes

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**TN 89-36**  
**September 1989**  
**(Also listed under Personnel.)**

**R. E. Chatfield**  
**S. A. Gullett**

***Development of a USMC Officer Assignment Decision  
Support System: Economic Analysis***

**Approved for public release; distribution is unlimited.**

This economic analysis was completed as part of the life cycle management process for development of an Officer Assignment Decision Support System (OADSS). This document provides information about costs associated with the two feasible alternatives for system development: (1) Existing System Enhancement; and (2) Distributed Processing--Minicomputer. System Development costs are divided into nonrecurring and recurring cost categories while "sunk" costs are excluded. A weighted benefits analysis revealed that the Distributed Processing--Minicomputer alternative would yield more benefits than Existing System Enhancement (591 vs. 500). However, a cost/benefit analysis conducted utilizing the Benefit-to-Cost Ratio (BCR) methodology indicated that the Existing System Enhancement alternative is preferable (1.60 vs. .94). Thus, while the Distributed Processing--Minicomputer alternative may be "ideal," it is significantly more costly and there is some question about the systems operation/maintenance capability of the Officer Assignment Branch. It is recommended that a functional description be completed as the next phase in development of OADSS.



## Journal Article

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**Mathematical and Computer  
Modeling, 12(11/12),  
1383-1391 (1988)**

A. W. Whisman  
J. Silverman  
R. F. Steuer

***Embedding a Manpower Optimization Model in a  
Managerial Environment***

Within the context of a complex manpower planning problem, this paper discusses issues of user control in multi-time period, multiple objective linear programming, issues that must be addressed when embedding such problems in a decision support system. Discussed are issues including the modeling of time series objectives, interactivity that provokes a full learning experience, the ability of the user to "steer" the model by inducing intended effects, the layering of solution information and the use of tabulation and graphical displays to access this information.

## Technical Reports

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TR 89-7  
March 1980  
(AD-A206 630)  
(Also listed under Testing  
Systems.)

P-A. Federico

### *Computer-based and Paper-based Measurement of Recognition Performance*

**Approved for public release; distribution is unlimited.**

Eighty-three subjects were administered computer-based and paper-based tests to assess recognition of aircraft silhouettes in order to determine the relative reliabilities and validities of these two measurement modes. Estimates of internal consistencies, equivalences, and discriminative and predictive validities were computed. It was established that (1) computer-based and paper-based measures of recognition test score were not significantly different in reliability or internal consistence; (2) the paper-based measure of average degree of confidence in recognition judgments was more reliable or internally consistent than the computer-based measure; (3) computer-based and paper-based measures of average degree of confidence were more equivalent than these measures of recognition test score; (4) according to two sets of criteria, the discriminant coefficients and F-ratios and corresponding means, the discriminative validities of computer-based and paper-based measures were about the same for distinguishing groups above or below mean average curriculum grade; (5) according to another set of criteria, the pooled within-groups correlations between the discriminant function and computer- and paper-based measures, the former had superior discriminative validity than the latter; and (6) statistics associated with the canonical correlation suggested the predictive validity of computer-based measures approximates that of paper-based measures.

## Technical Reports

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TR 89-10  
June 1989  
(AD-A209 639)  
(Also listed under Testing)  
Systems.)

M. J. Bosshardt

***Utility of Five Psychomotor Abilities for First-term  
Navy Enlisted Performance***

**Approved for public release; distribution is unlimited.**

The psychomotor ability literature was reviewed to evaluate the validity, incremental validity (over general ability), and computer adaptability of tests measuring five psychomotor abilities (multilimb coordination, control precision, arm-hand steadiness, finger dexterity, manual dexterity). The validity results indicated that tests of multilimb coordination, control precision, finger dexterity, and manual dexterity have shown useful levels of validities. Incremental validity results were limited and mixed, with multilimb coordination tests showing most promise. Computer tests with useful levels of validity were found for two psychomotor abilities--multilimb coordination and control precision. No computer tests or computer-adaptable tests were found for manual dexterity and finger dexterity. Overall, the results suggest that computerized measures of multilimb coordination and control precision may be useful for Navy selection and classification.

TR 89-11  
June 1989  
(AD-A210 081)

R. A. Bruce  
R. L. Burch

***Officer Career Development: Modeling Married  
Aviator Retention***

**Approved for public release; distribution is unlimited.**

Since fiscal year 1982, the aviation warfare community has been confronted with decreasing percentages of pilots who remain in the Navy more than 2 years beyond their minimum service requirement. The purpose of this report is to describe the factors contributing to naval aviation retention and to create a model that could be used for predictive purposes. Questionnaire data from a matched random sample (commissioning years 1972 to 1980) of stayers (N = 237) and leavers (N = 237) were analyzed. The resultant path model was able to account for 48 percent of the variance in retention behavior, even up to 4 years after the survey was taken. Interestingly, evaluation of sea duty (and family

## Technical Reports

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**TR 89-13**  
**July 1989**  
**(AD-A213 678)**

L. R. James  
C. K. Hertzog

**TR 89-14**  
**July 1989**  
**(AD-A211 346)**  
**(Also listed under Testing Systems.)**

D. P. Saccuzzo  
G. E. Larson  
J. Brown

separation because of deployments) *did not* add to our ability to account for retention behavior. Our findings suggest a possible causal chain from individual, organizational, and environmental factors, through career intent, and finally, dependant upon past performance evaluations, to retention.

***Officer Career Development: Analytic Strategy Recommendations***

**Approved for public release; distribution is unlimited.**

Strategies are recommended for analyzing information from the data bank developed by the Personnel Distribution and Career Development (PDCD) work unit for the purpose of establishing empirically-based decision guides to assist in the design and implementation of career policy and practice in the U.S. Navy. A set of analytic models is proposed wherein each model addresses an important issue concerning the development of empirically-based decision guides for career development. The statistical assumptions underlying each model are reviewed, as are methods that may be used to reasonably satisfy these assumptions. Estimation techniques and procedures for avoiding common errors in estimation also receive attention.

***The Effect of Incentives on the Reliability and Validity of Cognitive Speed Tests***

**Approved for public release; distribution is unlimited.**

In the present study, financial incentives were used to motivate test takers so that the effect of motivation on elementary cognitive tests could be determined. One hundred and nine male and female volunteer college students were tested on a battery of microcomputerized cognitive tests. One hundred of these subjects returned for a second session in which they were randomly assigned to an incentive or no incentive condition and then retested. The effort expended on the tests was measured via heart rate, skin conductance, and a self-report questionnaire pertaining to

## Technical Reports

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the perceived level of difficulty of the tests and amount of effort expended on them. Criterion measures, including the Advanced Otis-Lennon Test of Mental Abilities, Standard and Advanced Raven Progressive Matrices, and scores on the Scholastic Aptitude Test were also taken. The findings revealed that incentives led to better performance only on the most complex task in the study. In no case, however, did incentives affect the overall IQ-performance correlation for the tests used in the battery. These results support the view that correlations between cognitive speed and intelligence reflect common mental capacities, rather than some affective variable such as motivation.

TR 89-16  
June 1989  
(AD-A211 732)

H. G. Baker  
E. P. Somer  
D. J. Murphy

### *Navy Recruiter Survey: Management Overview*

Approved for public release; distribution is unlimited.

The objectives of the Recruiter Survey Project were to identify both positive and negative aspects of the recruiting job and opportunities for improvement in recruiter effectiveness and quality of work life. This management report is the third in a series. It presents an overview of results from a survey of all Navy production recruiters. The survey was conducted in February 1989, at the direction of the Recruiting Long-range Plan Study Group. Results are discussed under the following subjects: personal characteristics, family status, career plans, selection and training, station assignment and work environment, goaling, incentives and awards, career development, quality of life, the product and advertising, and support.

## Technical Reports

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**TR 89-17**  
**August 1989**  
**(AD-A213 360)**

**E. W. Kerce**

### ***Navy Corrections Programs Evaluation. Volume 1. Design***

**Approved for public release; distribution is unlimited.**

A comprehensive program evaluation and data collection plan to assess the effectiveness of recent modifications to the Navy disciplinary system is presented. It provides methods for evaluating the impact of correctional restoration policies on the Navy by assessing the retention and performance of sailors returned to active duty following confinement in correctional institutions. It also includes provisions for evaluating organizational processes, such as the integrity of program implementation across sites, the appropriateness of retraining interventions, and the efficacy of a unit management system. It addresses the theoretical justification for specific program elements and employs measures derived from applicable theory. A conceptual model of the Navy corrections program showing factors affecting program impact was developed, and measures for each of the factors were specified. Instruments were designed to collect data from staff and prisoners, to be used in conjunction with archival records. A series of research questions and hypotheses are proposed and an analysis plan is suggested. Success criteria, methods for tracking individuals after release from corrections facilities, and recommendations for implementing the evaluation system are included.

**TR 89-18**  
**September 1989**  
**(AD-A213 471)**

**I. Neumann**  
**J. D. Mattson**  
**N. M. Abrahams**

### ***Development and Evaluation of an Officer Potential Composite***

**Approved for public release; distribution is unlimited.**

A variety of selection factors related to United States Naval Academy (USNA) success have been combined into a single composite measure, the Candidate Multiple (CM), to serve as the primary tool for evaluating candidates. Although the CM is useful for predicting midshipmen performance, it has not included selection factors concerned with officer



## Technical Reports

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potential. The primary objective of this effort is to expand the scope of the USNA selection system to include the prediction of officer performance. The overall validation strategy involved four major components: (1) development of an officer performance criterion, (2) evaluation of current selection scores to predict that criterion, (3) development and validation of new measures to predict that criterion, and (4) determination of the relationship between officer performance predictors and USNA success. In evaluating various measures of officer performance, a score based on recommendations for promotion (from cumulative officer fitness reports) provided sufficient variability to use as a criterion. In addition to providing meaningful differentiation among officers, the Recommended for Early Promotion (REP) was significantly related to military and academic performance as a USNA midshipman. Two CM components, Combined Extracurricular Activities (COMPECA) and high school officials' Recommendations (RECS), exhibit significant relationships with the REP criterion. An experimental predictor showed a low positive relationship with the REP and combined with COMPECA and RECS to form an officer performance composite (OPC). It appears that use of the OPC in selection would not adversely affect midshipman performance. Based on these results, it is recommended that: (1) the experimental measure of officer performance (REP) be further evaluated by examining its relationship to measures or status variables concerned with actual promotion and promotion rates, (2) the relationship between officer retention and the experimental criterion (REP) be explored, and (3) the officer potential composite (OPC) be considered for integration into the current USNA selection system.

## Technical Notes

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**TN 89-2**  
**October 1988**  
**(AD-A199 767)**  
**(Also listed under Testing**  
**Systems.)**

**M. J. Bosshardt**

### ***Importance of Psychomotor Abilities for First-term Navy Enlisted Performance***

**Approved for public release; distribution is unlimited.**

This study examined the importance of nine psychomotor abilities for predicting first-term Navy performance. Two Navy "A" school training instructors from each of 19 ratings completed a questionnaire regarding the importance of various psychomotor and ASVAB-related abilities. Results indicated that five psychomotor abilities (multilimb coordination, control precision, arm hand steadiness, manual dexterity, finger dexterity) were rated as being important for first-term performance, with multilimb coordination and control precision rated as most important. Tasks performed by first-term Navy personnel requiring psychomotor abilities were identified. Finally, Navy ratings having the greatest psychomotor ability requirements were identified.

**TN 89-4**  
**October 1988**  
**(AD-A203 764)**

**W. C. Borman**  
**V. A. Peterson**

### ***Voluntary Turnover: A Review of the Literature***

**Approved for public release; distribution is unlimited.**

Psychology literature on turnover and attrition is reviewed. Each section of the review contains a summary of the relevant papers and an annotated bibliography of representative articles. Sections include: (1) turnover model development and model testing; (2) work investigating demographic, psychological, and work-related predictors of turnover/attrition; and (3) studies involving attrition from college and military training programs.

## Technical Notes

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**TN 89-5**  
**October 1988**  
**(AD-A200 464)**

J. R. Bruni  
G. L. Wilcove

***Officer Career Development: Preliminary Surface Warfare Officer Perceptions of a Major Career Path Change***

**Approved for public release; distribution is unlimited.**

This report is the ninth in a series of officer career development. In 1983, the Navy instituted a major career path change in the Surface Warfare Officer community. The purpose of this change was to increase the technical knowledge and skills of department heads, and thus, operational readiness. The survey research was designed to assess the preliminary acceptance among officers of this career change. Questionnaires were completed by 2,583 surface warfare officers as part of an ongoing research project studying the impact of career management policies on officer career decisions and actions. It was found that officers were generally favorably disposed toward the new policy. There was no preliminary indication that the adjustment in the career path would have any impact on an individual's desire to make the Navy a career or to extend beyond 20 years. Recommendations were made for further research and for developing reliable, objective measures of departmental and fleet readiness.

**TN 89-6**  
**October 1988**  
**(AD-A201 370)**  
**(Also listed under Education and Training.)**

M. H. Blankenship  
L. J. Trejo  
G. W. Lewis

***Brain Activity During Tactical Decision-making: IV. Event-related Potentials as Indices of Selective Attention and Cognitive Workload***

**Approved for public release; distribution is unlimited.**

This report, the fourth in a series of reports concerned with the use of neuroelectric signals to predict the decision-making performance of combat system operators, provides detailed analyses of the neuroelectric changes that occur as workload increases in a combat system simulation.

## Technical Notes

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**TN 89-7**  
**October 1988**  
**(AD-A203 763)**  
**(Also listed under Education and Training.)**

M. H. Blankenship  
L. J. Trejo  
G. W. Lewis

***Brain Activity During Tactical Decision-making: V. A Cross-study Validation of Evoked Potentials as Indices of Workload***

**Approved for public release; distribution is unlimited.**

This report, the fifth in a series of reports concerned with the use of neuroelectric signals to predict the decision-making performance of combat system operators, provides detailed analyses of a cross-validation from two studies which used neuroelectric signals as predictors. It is important that the neuroelectric signals be reliable measures of operator performance if they are to be used in assessing operator workload.

**TN 89-10**  
**January 1989**  
**(AD-A204 663)**

S. H. Osipow

***Career Development Models: A Brief Overview of Relevant Theory***

**Approved for public release; distribution is unlimited.**

This literature review surveys those theories that currently influence the thinking of career development workers. Additionally, this review discusses new approaches that may not yet have empirical support but which exhibit promise or potential for guiding research.

**TN 89-11**  
**January 1989**  
**(AD-A204 608)**  
J. E. Edwards  
P. J. Thomas  
J. L. Bower

***Moving for Employment: Are Hispanics Less Geographically Mobile than Anglos and Blacks?***

**Approved for public release; distribution is unlimited.**

The belief that Hispanics are reluctant to relocate was investigated as part of the effort to explain and correct the underrepresentation of Hispanics in Navy's civilian work force. A survey was administered in 1987/1988 to approximately 1,450 persons in Texas; 51 percent Hispanic, 38 percent Anglo, and 11 percent Black. The survey contained items addressing the likelihood of moving to specific states with large Navy facilities for given types of jobs and if certain conditions were met.

## Technical Notes

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No significant differences were found among the three groups in willingness to move if certain incentives were offered. Hispanics, however, were significantly less interested in moving to states that have low Hispanic representation. Differences in types of jobs found attractive by the groups were also found. It was concluded that in areas with high concentrations of Hispanics, recruitment efforts for jobs in areas with a low concentration of Hispanics would have limited success. The findings need to be replicated, however, and the factors affecting the relocation decision process need to be identified.

**TN 89-12**  
**January 1989**  
**(AD-A205 548)**

R. F. Morrison  
T. M. Brantner

### ***Unrestricted Line Officers and the Materiel Professional Career***

**Approved for public release; distribution is unlimited.**

This report examines career issues in a situation where unrestricted line officers concurrently develop competence within two occupational fields. There are two sets of analyses described herein. The first uses data, collected in 1982, to compare 33 aviation and surface officers that declined the opportunity to transfer to the materiel professional community with 115 accepting the transfer in 1986. The difference between the two groups was centered primarily on their perceived interest in the type of work that they wanted to do. The second set of analyses uses 1986 data to describe the processes that aviation, surface, and submarine officers in the materiel professional community use to make their career decisions and their perceptions of the materiel professional program.

**TN 89-13**  
**February 1989**  
**(AD-A205 545)**

J. N. Cleveland

### ***Research Needs in the Management of Concurrent Dual Career Development: Military and Industry Findings and Research Approach***

**Approved for public release; distribution is unlimited.**

The development of members of the unrestricted line (URL) community as potential materiel professionals (MPs) is

## Technical Notes

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extremely vital to the Navy because of the operational experience that these officers can bring to the MP positions. However, few junior officers have developed their MP abilities in the past. The Navy currently has not developed policies to aid the URL officer in the simultaneous development of two partially related skills. Therefore, there is a need to develop a framework for understanding and identifying the parameters involved in the effective design and administration of policy for URL officers in the concurrent development of dual careers. This report describes policies and practices used in other organizations (Air Force, Army, and industry) to manage dual career personnel. The results of a literature review (the first report in the series) and the review of external experience are compared with the Navy's policies, practices, and future needs. The voids that are identified between what is needed and what is present are used to specify the research that should be done to provide the policy, practices, and technology required to meet the Navy's requirements for managing the URL MP manpower resources.

**TN 89-14**  
**February 1989**  
**(Also listed under Manpower.)**

**R. E. Chatfield**  
**S. A. Gullett**

### ***Development of a USMC Officer Assignment Decision Support System: Feasibility Study***

**Approved for public release; distribution is unlimited.**

Four alternative approaches to development of an Officer Assignment Decision Support System (OADSS) to improve current methods of officer assignment in the United States Marine Corps were evaluated. This feasibility study examined both the operational and technical feasibility of the four alternatives and considered such factors as hardware, software, and communications. Both Existing System Enhancement and Distribution Processing--Microcomputer alternatives were deemed feasible but the former has a more favorable cost-benefits ratio, better in-house system support and will expedite system implementation. However, it is recommended that an economic analysis be conducted to further evaluate the two feasible alternatives.

## Technical Notes

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**TN 89-20**  
**June 1989**

**J. N. Cleveland**

***Literature Review on Concurrent Dual Career  
Development in the URL***

**Approved for public release; distribution is unlimited.**

The development of members of the unrestricted line (URL) community as potential materiel professionals (MP) is extremely vital to the Navy because of the operational experience that these officers can bring to the MP positions. However, few junior officers have developed their MP abilities in the past. The Navy currently has not developed policies to aid the URL officer in the simultaneous development of two partially related skills. Therefore, there is a need to develop a framework for understanding and identifying the parameters involved in the effective design and administration of policy for URL officers in concurrent development of dual careers. One objective of this contract was to review and integrate available research and practice on dual career ladders. The outcome of this review identifies 10 career areas that contribute to the development and management of dual or multiple career ladders. The primary conclusion was that there is a need to develop an integrated human resource system that will support both the operational needs of the URL and the managerial/technical needs of the MP community.

**TN 89-21**  
**June 1989**

**J. Kantor**

***The Utilization of Biographical Information for the  
Reduction of Motivational Attrition in the NROTC  
Scholarship Program***

**Approved for public release; distribution is unlimited.**

Voluntary resignation (motivational attrition) from the Naval Reserve Officer Training Corps (NROTC) is approximately 26 percent. Selecting out candidates with potential high risk of attrition would save the Navy millions of dollars annually. Unfortunately, the current selection

## Technical Notes

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composite is not predictive of motivational attrition. This effort investigated the usefulness of existing biographical information items (biodata) for predicting motivational attrition.

Students from the entering classes of 1982 and 1983 served as subjects for the study. Analyses of the biodata revealed that graduates were more certain about their chosen careers, participated in more athletic events, and were more active in their high schools student governments than motivational attritees. Graduates came into the scholarship program with lower measured aptitude scores in mathematics. In college, however, they had higher grades in naval science courses, and earned higher naval officer aptitude scores than did motivational attritees. Continuing research is needed for the development of a detailed biodata questionnaire to predict motivational attrition from the NROTC scholarship program.

TN 89-23  
June 1989  
(AD-A210 094)

M. D. Thomas  
J. Lawson

### *The Effectiveness of Sex Education in the United States*

Approved for public release; distribution is unlimited.

Despite the widespread availability of sex education programs in the United States, the rate of unplanned pregnancies among women continues to rise, a trend reflected in the number of Navy women who become pregnant during their first enlistment. A literature review was conducted to identify the major variables influencing pregnancy and birth rates among young women, and to determine the effectiveness of traditional sex education programs in reducing the rate of unplanned pregnancy. Traditional classroom sex education has been shown to increase knowledge of sexual subjects and to change attitudes, but has little or no effect on sexual activity, contraceptive use, or teenage pregnancy. The school-based clinic is a promising model that the Navy might, in part, emulate as an intervention strategy to prevent unplanned pregnancies in Navy enlisted women.



## Technical Notes

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**TN 89-24**  
**June 1989**

D. E. Super  
D. D. Nevill

***Work Importance and its Measurement: Review of the Literature***

**Approved for public release; distribution is unlimited.**

This report reviews the literature on work importance and constitutes an important prelude to a study that is being conducted to determine the importance of work in the life patterns and life plans of career and non-career personnel in the United States Navy. Important dimensions of work and of the work milieu are examined for the relative importance and degree of impact of these dimensions on overall work importance.

**TN 89-25**  
**June 1989**  
**(AD-A210 080)**

R. A. Bruce

***Officer Career Development: Fleet Perceptions of the Aviation Duty Officer Program***

**Approved for public release; distribution is unlimited.**

This report is one of a series examining officer career development. In response to the ever-growing shortage of pilots, the Aviation Duty Officer (ADO) community was created. This officer designation was designed for pilots who have demonstrated outstanding aviation skills and who wish to remain in flying-related billets throughout their careers. The purpose of this report was to help policy makers assess fleet acceptance of the new community. Questionnaire data from pilots (N = 2,353) were analyzed to answer specific questions regarding fleet perceptions. In general, an ADO-type career was acceptable to 49 percent of the pilots. However, only 12 percent of our sample find the ADO program acceptable when taking into account the lack of squadron command opportunity. Recommendations were presented regarding how to improve fleet acceptance of the ADO program.

## Technical Notes

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**TN 89-27**  
**July 1989**  
**(AD-A211 345)**

L. R. James  
C. Hertzog

***Officer Career Development: An Overview of Analytic Concerns***

**Approved for public release; distribution is unlimited.**

A review is provided of the data bank developed by the Personnel Distribution and Career Development (PDCD) work unit for the purpose of establishing empirically-based decision guides to assist in the design and implementation of career policy and practice in the U.S. Navy. Salient methodological issues and problems likely to be encountered in analyses of data from the data bank are also considered.

**TN 89-31**  
**August 1989**  
**(AD-A212 584)**

P. W. Giannetto

***Annotated Bibliography of Recruiting-related Research: 1970-1989***

**Approved for public release; distribution is unlimited.**

This report contains an annotated bibliography of recruiting-related research accomplished by the NPRDC during the period 1970-1989.

**TN 89-32**  
**August 1989**  
**(AD-A212 584)**  
**(Also listed under Manpower.)**

R. E. Chatfield  
S. A. Gullett

***Development of a USMC Officer Assignment Decision Support System: Functional Description***

**Approved for public release; distribution is unlimited.**

This functional description was completed as part of the life cycle management process for development of an Officer Assignment Decision Support System (OADSS). The document provides information about system performance requirements, preliminary design considerations, and end-user impacts attributable to system implementation. Existing methods of officer assignment are summarized and proposed improvements are detailed. System benefits are grouped into four categories: functional improvements, improvements of degree, timeliness, and elimination/reduction of existing capabilities no longer required. Details pertaining to system

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**TN 89-33**  
**September 1989**  
**(AD-A212 583)**

P. A. Alba  
H. G. Baker

input/output, data bases, failure contingencies, and security are also provided. It is recommended that a Data Requirements Document be completed as the next phase in development of OADSS.

***Multi-method Performance Measurement for Marine Corps J-79 Jet Engine Mechanics***

**Approved for public release; distribution is unlimited.**

This report details the pilot administration of a job performance measurement package designed to assess first-term U.S. Marine Corps (USMC) J-79 jet engine mechanic job proficiency. The data collection reported herein completes an important inter-service transfer of testing technology, a cooperative effort between the Air Force and the Navy. The findings hold important implications for future research in job performance measurement throughout the domain of industrial-organizational psychology.

**TN 89-34**  
**September 1989**

P. Ford  
J. Doyle  
S. Schultz  
R. G. Hoffman  
S. E. Lammlein  
C. K. Owens-Kurtz  
V. M. Berry

***Job Performance Measurement Test Package for the Navy Radiomen***

**Approved for public release; distribution is unlimited.**

This report contains all the test instruments for performance measurement of Navy radiomen.

## Technical Notes

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**TN 89-36**  
**September 1989**  
**(Also listed under Manpower.)**

**R. E. Chatfield**  
**S. A. Gullett**

***Development of a USMC Officer Assignment Decision  
Support System: Economic Analysis***

**Approved for public release; distribution is unlimited.**

This economic analysis was completed as part of the life cycle management process for development of an Officer Assignment Decision Support System (OADSS). This document provides information about costs associated with the two feasible alternatives for system development: (1) Existing System Enhancement; and (2) Distributed Processing--Minicomputer. System Development costs are divided into nonrecurring and recurring cost categories while "sunk" costs are excluded. A weighted benefits analysis revealed that the Distributed Processing--Minicomputer alternative would yield more benefits than Existing System Enhancement (591 vs. 500). However, a cost/benefit analysis conducted utilizing the Benefit-to-Cost Ratio (BCR) methodology indicated that the Existing System Enhancement alternative is preferable (1.60 vs. .94). Thus, while the Distributed Processing--Minicomputer alternative may be "ideal," it is significantly more costly and there is some question about the systems operation/maintenance capability of the Officer Assignment Branch. It is recommended that a functional description be completed as the next phase in development of OADSS.

## Journal Articles

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**Military Personnel  
Measurement Testing,  
Assignment, Evaluation,  
41-73 (1989)**

L. P. Kroeker

**Personnel Journal, 68(6),  
144-149 (June 1989)**

J. E. Edwards  
P. J. Thomas

**The Journal of General  
Psychology, 116(2), 145-154  
(1989)**

P. Rosenfeld  
L. M. Doherty  
S. M. Vicino  
J. Kantor  
J. Greaves

***Personnel Classification/Assignment Models***

Each month the Armed Services take in thousands of persons who must be placed among a broad range of jobs. Each person inducted must be utilized somewhere within a particular service branch. The classification problem, which is the central question addressed here, consists of arranging assignment procedures so that a close match between human skills and job requirements is achieved. A substantial portion of the discussion deals with the quality of matches resulting from various personnel assignment procedures. An optimal matching of persons and jobs is one that cannot be improved upon by any other allocation. The optimal assignment problem is of major interest to both military managers and civilian executives, because of the costs associated with inappropriate matches.

***HISPANICS: When has Equal Employment been  
Achieved?***

This article presents a number of points which highlight the problems associated with counting Hispanics in the U.S., both documented and undocumented. The importance of an accurate national count is discussed; particularly with respect to the effective functioning of the Equal Employment Opportunity Program of the United States.

***Attitude Assessment in Organizations: Testing Three  
Microcomputer-based Survey Systems***

The interface of social psychology and organizational behavior is illustrated in the area of attitude assessment, which played a central role in social psychology and other fields, such as management, marketing, and organizational behavior. Organizations have increasingly used attitude surveys to assess employee concerns. To increase speed and efficiency, we suggest the use of computers to administer organizational surveys. Although recent studies have compared computer administration of a survey to an equivalent paper-and-pencil version, there has not been a

## Journal Articles

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**Personal Individual Differences, 10(11), 1185-1188 (1989) (Also listed under Testing Systems.)**

G. E. Larson  
K. E. Lattin

**Intelligence, 13, 5-31 (1989) (Also listed under Testing Systems.)**

G. E. Larson  
D. P. Saccuzzo

comparative test among various computer systems to determine whether presentation differences (speed, size, color) affect user satisfaction. We compared three systems, CENSUS, MASQ, and P-MASQ, to each other as well as to a paper-and-pencil version of an attitude survey administered to 296 civilian Navy personnel. All three systems produced responses equivalent to each other and to the paper-and-pencil administration. American civilian supervisors surveyed on computers rated it more enjoyable than did those surveyed with the paper-and-pencil version.

### ***Discriminant Validity and Information Processing: The Case of 'Verbal Correlates'***

Many studies have reported significant correlations between verbal ability and speed of retrieving letter names from memory. Data is presented indicating that the relationship is not task-specific. Rather, verbal skill and letter-naming speed correlations are task specific because both measure general intelligence. The results reported highlight the importance of employing convergent/discriminant procedures when building cognitive models of aptitude.

### ***Cognitive Correlates of General Intelligence: Toward a Process Theory of g***

The cognitive correlates literature suggests that a general ability, probably Spearman's *g*, underlies most information processing/intelligence relationships. In the present paper we suggest that the nature of *g* is clarified by the following patterns: (1) response consistency has better predictive and convergent validity than does response speed, and (b) tasks which demand dynamic memory processing predict intelligence better than do tasks which require only stimulus encoding and simple stimulus/response translations. Accordingly, *g* appears related to the ability to flexibly and consistently reconfigure the contents of working memory. A possible physiological basis of this ability is the recruitment

## Journal Articles

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**The Journal of General  
Psychology, 116(2),**

**215-219 (1989)**  
R. A. Giacalone

of the transient neural assemblies which underlie thought (after Hebb, 1949).

***The Effect of Sex and Impression Management on  
Future Salary Estimations***

Previous research has shown that American women are treated both verbally and nonverbally as lower in status than men (Henley & Freeman, 1981; Riess & Salzer, 1981). Impression-management research has found that people engage in less self-aggrandizing and self-effacing behaviors for a low status, as opposed to a high status, audience (Schlenker, 1980). We found that undergraduates inflated or modestly attenuated their future salary estimations depending on whether their parents would or would not be told of their responses and that this differential response pattern occurred only when female students were interviewed by a male researcher.

**Military Psychology, 1(1), 3-16  
(1989)**

G. J. Laabs  
H. G. Baker

***Selection of Critical Tasks for Navy Job Performance  
Measures***

In the Armed Services, a major research focus is the development of job-sample tests that can serve as benchmark measures against which other performance measures can be compared. This article presents the method used to identify a set of critical tasks that will be used in developing job-sample tests and other performance measures for Navy radiomen (RMs). Guion's (1979) paradigm for reducing the job to a job sample guided the selection process. A set of critical tasks was compiled based on job analyses, interviews, observations, card sorts, factor analysis, and survey results. The final list of selected tasks was evaluated for acceptance by RM job experts. The evaluations confirmed the validity of the selected critical tasks. In addition, the set of tasks was superior to those produced through use of random sampling procedures.

## Journal Articles

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**Book Chapter for Testing,  
Theoretical and Applied  
Perspectives, PRAEGER,  
New York (1989)  
(Also listed under  
Education and Training.)**

G. W. Lewis  
R. C. Sorenson

### ***Evoked Brain Activity and Personnel Performance***

The primary thrust of the neuroscience research program at NPRDC is to develop a technology for measuring evoked brain activity that correlates with the performance of military personnel and serves as a predictor of that performance. It is the objective here to present a brief discussion of individual difference measurement and its history, and then to present evidence for the relationship between neuroelectric recordings and aptitude. The relationship between evoked potential and on-the-job performance assessment will be emphasized. In conclusion, new techniques to improve the sensitivity of brain function measure using the neuromagnetic evoked field will be discussed.



## Technical Reports

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**TR 89-4**  
**January 1989**  
**(AD-A202 152)**  
**(Also listed under Education**  
**and Training.)**

P-A. Federico  
N. L. Liggett

### ***Computer-based and Paper-based Measurement of Semantic Knowledge***

**Approved for public release; distribution is unlimited.**

Seventy-five subjects were administered computer-based and paper-based tests of threat-parameter knowledge represented as a semantic network in order to determine the relative reliabilities and validities of these two assessment modes. Estimates of internal consistencies, equivalences, and discriminant validities were computed. It was established that (1) computer-based and paper-based measures (i.e., test score and average degree of confidence) are not significantly different in reliability or internal consistence; (2) for computer-based and paper-based measures, average degree of confidence has a higher reliability than average response latency which in turn has a higher reliability than the test score; (3) a few of the findings are ambivalent since some results suggest equivalence estimates for computer-based and paper-based measures (i.e., test score and average degree of confidence) are about the same, and another suggests these estimates are different; and (4) the discriminant validity of the computer-based measures was superior to paper-based measures. The results of this research supported the findings of some studies, but not others. As discussed, the reported literature on this subject is contradictory and inconclusive.

**TR 89-6**  
**February 1989**  
**(AD-A205 860)**

D. L. Alderton

### ***Development and Evaluation of Integrating Details: A Complex Spatial Problem Solving Test***

**Approved for public release; distribution is unlimited.**

This report summarizes the theory behind and the development, evaluation, and refinement of a complex spatial processing test, *Integrating Details*. In the course of revamping and making the Armed Services Vocational Aptitude Battery (ASVAB) adaptive, the opportunity exists

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for replacing or adding tests to the battery. Tests of spatial ability, a major dimension of human intelligence, are not represented in the ASVAB so they are reasonable candidates for inclusion. The vast psychometric literature on spatial ability suggests that only complex spatial tests are likely to be valid for both school and job performance. Theoretical and empirical work from visual cognition and mental imagery provided further guidelines for the development of a complex spatial test. Methodological techniques from componential analysis were used to instantiate the test and develop an information processing model for test item solution. The results suggest that *Integrating Details* is a complex spatial problem-solving test, that it is relatively independent of verbal ability, and that it is reliable and has substantial construct validity. Furthermore, analyses demonstrate that the ability measured by *Integrating Details* is substantially unique from those measured by the ASVAB. Thus there is ample opportunity for the test to augment the predictive validity of the ASVAB. A final 40-item version of the test is recommended for advanced development and validation with military enlisted personnel.

TR 89-7  
March 1980  
(AD-A206 630)  
(Also listed under Personnel.)

P-A. Federico

### *Computer-based and Paper-based Measurement Recognition Performance*

Approved for public release; distribution is unlimited.)

Eighty-three subjects were administered computer-based and paper-based tests to assess recognition of aircraft silhouettes in order to determine the relative reliabilities and validities of these two measurement modes. Estimates of internal consistencies, equivalences, and discriminative and predictive validities were computed. It was established that (1) computer-based and paper-based measures of recognition test score were not significantly different in reliability or internal consistence; (2) the paper-based measure of average degree of confidence in recognition judgments was more reliable or internally consistent than the

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TR 89-10  
June 1989  
(AD-A209 639)  
(Also listed under Personnel.)

M. J. Bosshardt

computer-based measure; (3) computer-based and paper-based measures of average degree of confidence were more equivalent than these measures of recognition test scores; (4) according to two sets of criteria, the discriminant coefficients and F-ratios and corresponding means, the discriminative validities of computer-based and paper-based measures were about the same for distinguishing groups above or below mean average curriculum grade; (5) according to another set of criteria, the pooled within-groups correlations between the discriminant function and computer- and paper-based measures, the former had superior discriminative validity than the latter; and (6) statistics associated with the canonical correlation suggested the predictive validity of computer-based measures approximates that of paper-based measures.

### *Utility of Five Psychomotor Abilities for First-term Navy Enlisted Performance*

Approved for public release; distribution is unlimited.

The psychomotor ability literature was reviewed to evaluate the validity, incremental validity (over general ability), and computer adaptability of tests measuring five psychomotor abilities (multilimb coordination, control precision, arm-hand steadiness, finger dexterity, manual dexterity). The validity results indicated that tests of multilimb coordination, control precision, finger dexterity, manual dexterity have shown useful levels of validities. Incremental validity results were limited and mixed, with multilimb coordination tests showing most promise. Computer tests with useful levels of validity were found for two psychomotor abilities--multilimb coordination and control precision. No computer tests or computer-adaptable tests were found for manual dexterity and finger dexterity. Overall, the results suggest that computerized measures of multilimb coordination and control precision may be useful for Navy selection and classification.

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**TR 89-14**  
**July 1989**  
**(AD-A211 346)**  
**(Also listed under Personnel.)**

D. P. Saccuzzo  
G. E. Larson  
J. Brown

### ***The Effect of Incentives on the Reliability and Validity of Cognitive Speed Tests***

**Approved for public release; distribution is unlimited.**

In the present study, financial incentives were used to motivate test takers, so that the effect of motivation on elementary cognitive tests could be determined. One hundred and nine male and female volunteer college students were tested on a battery of microcomputerized cognitive tests. One hundred of these subjects returned for a second session in which they were randomly assigned to an incentive or no incentive condition and then retested. The effort expended on the tests was measured via heart rate, skin conductance, and a self-report questionnaire pertaining to the perceived level of difficulty of the tests and amount of effort expended on them. Criterion measures, including the Advanced Otis-Lennon Test of Mental Abilities, Standard and Advanced Raven Progressive Matrices, and scores on the Scholastic Aptitude Test were also taken. The findings revealed that incentives led to better performance only on the most complex task in the study. In no case, however, did incentives affect the overall IQ-performance correlation for the tests used in the battery. These results support the view that correlations between cognitive speed and intelligence reflect common mental capacities, rather than some affective variable such as motivation.

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**TN 89-2**  
**October 1988**  
**(AD-A199 767)**  
**(Also listed under Personnel.)**

**M. J. Bosshardt**

### ***Importance of Psychomotor Abilities for First-term Navy Enlisted Performance***

**Approved for public release; distribution is unlimited.**

This study examined the importance of nine psychomotor abilities for predicting first-term Navy performance. Two Navy "A" school training instructors from each of 19 ratings completed a questionnaire regarding the importance of various psychomotor and ASVAB-related abilities. Results indicated that five psychomotor abilities (multilimb coordination, control precision, arm hand steadiness, manual dexterity, finger dexterity) were rated as being important for first-term performance, with multilimb coordination and control precision rated as most important. Tasks performed by first-term Navy personnel requiring psychomotor abilities were identified. Finally, Navy ratings having the greatest psychomotor ability requirements were identified.

## Journal Articles

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**Personal Individual Differences, 10(11), 1185-1188 (1989) (Also listed under Personnel.)**

G. E. Larson  
K. E. Lattin

***Discriminant Validity and Information Processing: The Case of 'Verbal Correlates'***

Many studies have reported significant correlations between verbal ability and speed of retrieving letter names from memory. Data is presented indicating that the relationship is not task-specific. Rather, verbal skill and letter-naming speed correlations are task specific because both measure general intelligence. The results reported highlight the importance of employing convergent/discriminant procedures when building cognitive models of aptitude.

**Intelligence, 13, 5-31 (1989) a Process (Also listed under Personnel.)**

G. E. Larson  
D. P. Saccuzzo

***Cognitive Correlates of General Intelligence: Toward Theory of g***

The cognitive correlates literature suggests that a general ability, probably Spearman's *g*, underlies most information processing/intelligence relationships. In the present paper we suggest that the nature of *g* is clarified by the following patterns: (1) response consistency has better predictive and convergent validity than does response speed, and (b) tasks which demand dynamic memory processing predict intelligence better than do tasks which require only stimulus encoding and simple stimulus/response translations. Accordingly, *g* appears related to the ability to flexibly and consistently reconfigure the contents of working memory. A possible physiological basis of this ability is the recruitment of the transient neural assemblies which underlie thought (after Hebb, 1949).

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TR 89-2  
December 1988  
(AD-A202 153)

J. L. Dickieson  
W. F. Thode  
K. Newbury

### *Steamer II: Steamer Prototype Component Inventory and User Interface Commands*

**Approved for public release; distribution is unlimited.**

Over the last several years, NPRDC produced a Steamer prototype simulation of a 1200-psi steam plant. This simulation is installed on an expensive Symbolics minicomputer at the Surface Warfare Officers School Pacific (SWOSCOLPAC), Coronado, CA. Documentation of the Steamer prototype components and the user interface was needed.

Careful examination of the actual program code provided an inventory that describes the hardware, system software, and application software and lists the documentation for the prototype Steamer system. Similarly, systematic exercising of all menu options produced an inventory of the user interface commands.

TR 89-4  
January 1989  
(AD-A202 152)  
(Also listed under Testing Systems.)

P-A. Federico  
N. L. Liggett

### *Computer-based and Paper-based Measurement of Semantic Knowledge*

**Approved for public release; distribution is unlimited.**

Seventy-five subjects were administered computer-based and paper-based tests of threat-parameter knowledge represented as a semantic network in order to determine the relative reliabilities and validities of these two assessment modes. Estimates of internal consistencies, equivalences, and discriminant validities were computed. It was established that (1) computer-based and paper-based measures (i.e., test score and average degree of confidence) are not significantly different in reliability or internal consistence; (2) for computer-based and paper-based measures, the average degree of confidence has a higher reliability than the average response latency which in turn has a higher reliability than the test score; (3) a few of the findings are ambivalent since some results suggest

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TR 89-12  
June 1989  
(AD-A210 082)

J. L. Vogt  
E. R. N. Robinson  
B. E. Taylor  
W. H. Wulfeck, II

equivalence estimates for computer-based and paper-based measures (i.e., test score and average degree of confidence) are about the same, and another suggests these estimates are different; and (4) the discriminant validity of the computer-based measures was superior to paper-based measures. The results of this research supported the findings of some studies, but not others. As discussed, the reported literature on this subject is contradictory and inconclusive.

### *Authoring Instructional Materials (AIM): Automated Curriculum Development*

Approved for public release; distribution is unlimited.

The Navy faces a number of problems in managing the design, development, and maintenance of its curriculum materials. Many of these problems can be solved by the introduction of a set of computer-based tools for automating the curriculum development process. The AIM project is building these tools by applying the recent advances in instructional science, educational psychology, computer-assisted drafting and publishing, and computer science and technology. These tools will eventually allow Navy curriculum developers to efficiently produce standardized training materials that are technically accurate, to maintain this technical accuracy by easily updating the electronic data bases underlying the course materials and to distribute rapidly these text and graphic training materials over local and wide-area networks.



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**TN 89-6**  
**October 1988**  
**(AD-A201 370)**  
**(Also listed under Personnel.)**

M. H. Blankenship  
L. J. Trejo  
G. W. Lewis

***Brain Activity During Tactical Decision-making: IV.  
Event-related Potentials as Indices of Selective Attention  
and Cognitive Workload***

**Approved for public release; distribution is unlimited.**

This report, the fourth in a series of reports concerned with the use of neuroelectric signals to predict the decision-making performance of combat system operators, provides detailed analyses of the neuroelectric changes that occur as workload increases in a combat system simulation.

**TN 89-7**  
**October 1988**  
**(AD-A203 763)**  
**(Also listed under Personnel.)**

M. H. Blankenship  
L. J. Trejo  
G. W. Lewis

***Brain Activity During Tactical Decision-making: V.  
A Cross-study Validation of Evoked Potentials as Indices  
of Workload***

**Approved for public release; distribution is unlimited.**

This report, the fifth in a series of reports concerned with the use of neuroelectric signals to predict the decision-making performance of combat system operators, provides detailed analyses of a cross-validation from two studies which used neuroelectric signals as predictors. It is important that the neuroelectric signals be reliable measures of operator performance if they are to be used in assessing operator workload.

**TN 89-18**  
**April 1989**

P-A. Federico  
S. H. Bickel  
R. R. Ulrich  
T. E. Bridges  
B. Van de Wetering

**BATMAN (Battle-management Assessment System) &  
ROBIN (Raid Originator Bogie Ingress): Rationale,  
Software Design and Data Base Descriptions**

**Approved for public release; distribution is unlimited.**

This technical note contains the rationale, software design, and data base descriptions for BATMAN (Battle-management Assessment Systems) & ROBIN (Raid Originator Bogie Ingress). These software systems are being designed and developed to assess how well individuals can allocate, deploy, and manage air, surface, and/or subsurface tactical assets during simulated sea battles in many warfare

## Technical Notes

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areas. Together they form a desk-top, computer-based, performance-measurement system incorporating high resolution graphics and low level modeling. This system would fill the gap between board games that are run in real or fictitious time and with subjective assessment and inappropriate feedback with very expensive and man-hour-intensive, mainframe-based simulators. Two of the major contributions of these dual systems are a very friendly human-computer interface and automated performance assessment.

## Journal Article

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**Book Chapter for  
Theoretical and Applied  
Perspectives, PRAEGER,  
New York (1989)  
(Also listed under  
Education and Training.)**

G. W. Lewis  
R. C. Sorenson

### **Evoked Brain Activity and Personnel Performance**

The primary thrust of the neuroscience research program at NPRDC is to develop a technology for measuring evoked brain activity that correlates with the performance of military personnel and serves as a predictor of that performance. It is the objective here to present a brief discussion of individual difference measurement and its history, and then to present evidence for the relationship between neuroelectric recordings and aptitude. The relationship between evoked potential and on-the-job performance assessment will be emphasized. In conclusion, new techniques to improve the sensitivity of brain function measure using the neuromagnetic evoked field will be discussed.

## Technical Reports

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**TR 89-3**  
**December 1988**  
**(AD-A202 154)**

A. Houston  
S. L. Dockstader

***A Total Quality Management Process Improvement Model***

**Approved for public release; distribution is unlimited.**

The purpose of this report is to enhance the quality and productivity performance of naval logistics organizations through the application of a process improvement model. The process improvement model represents a systematic approach for the analysis and improvement of operations and resources used to create products or services. The present report describes the activities required to use the model.

**TR 89-9**  
**April 1989**  
**(AD-A208 176)**

M. A. White  
P. J. Konoske

***An Evaluation of Quality Circles in Department of Defense Organizations***

**Approved for public release; distribution is unlimited.**

This report describes the evaluation of quality circle programs in the Department of Defense (DoD). Rather than attempting to provide a final analysis of the value of quality circle programs to the DoD, this report describes the conditions and approaches necessary for a successful quality circle program. As such, this report should be used as a guide for future decisions concerning quality circle programs rather than as the final word on their utility to DoD.

## Technical Notes

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TN 89-9  
November 1988

S. W. Ferrier

### *Analysis of Information Exchange Using the Bases and Stations Information System*

**Approved for public release; distribution is unlimited.**

Effective management of complex organizations such as large Navy bases and stations requires maintenance of and ready access to significant amounts of information. The Bases and Stations Information System (BASIS) is a computer-based network currently under development to fulfill the command staffs' needs for timely and accurate information concerning base or station activities.

This is the final report of three prepared for the Naval Data Automation Command. The study was designed to determine the need for automating base-wide information exchange with a system such as BASIS. This was done by examining the nature and extent of interdepartmental information requirements within six functional areas or departments: administration, civil engineering/public works, comptroller, safety, security, and supply. Findings suggest that optimal attention be paid to automated exchange of information for the following areas: crisis response plans; status of funding; status of requisitions, repairs, facilities, contracts, and projects; status of work in progress; health, safety, and security statistics; and selected personnel information. Results are intended to assist BASIS program developers in selecting the most cost-effective approach for facilitating information exchange across departments of Navy bases and stations.

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**TN 89-17**  
**April 1989**  
**(AD-A208 155)**

**C. S. Greebler**  
**J. G. Suarez**  
**(Editors)**

### ***Total Quality Management Implementation: Selected Readings***

**Approved for public release; distribution is unlimited.**

The readings are organized into four sections. Section 1, "Management and Leadership Focus," contains an article that provides an orientation on the status of government-wide efforts to improve productivity. It describes the work of a number of federal agencies and identifies major challenges for them in the initiation of comprehensive quality improvement. Other articles discuss the new roles the quality professional will have in this transformation process.

Articles in Section 2, "Guidelines for the Development of TQM," discuss the critical elements and common components needed to initiate a TQM effort. Certain common elements required for a cultural transformation include top management commitment, the focus on continuous improvement and process analysis, use of extensive measurement, a customer orientation, long-term commitment and planning, and involvement of all members of the organization.

Section 3, "Quality Improvement Strategy," addresses more specifically the critical elements identified in Section 2. It focuses on some of the requirements for education and training and procedures for process improvement with an organization of cross-functional teams.

Articles in Section 4, "Case Studies: Special Applications of TQM," deal with case studies from the public sector, including DoD, the Internal Revenue Service, and the Equal Employment Opportunity Commission.

## Technical Notes

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**TN 89-19**  
**April 1989**  
**(AD-A208 222)**

C. S. Greebler  
J. G. Suarez

***Strategy for Educating the Department of Defense  
Acquisition Work Force in Total Quality Management***

**Approved for public release; distribution is unlimited.**

This strategy provides broad guidelines for planning and coordinating a TQM education and training program for the DoD acquisition work force. The strategy is organized around short-, mid-, and long-range goals. It also describes resources available to DoD training developers and managers who will subsequently be responsible for TQM education. Included in this strategy is a description of the educational requirements for a TQM awareness program directed at senior-level managers and general managers. A methodology for training development is also proposed.

**TN 89-28**  
**July 1989**  
**(AD-A211 942)**

C. S. Greebler  
J. G. Suarez

***An Education and Training Strategy for Total Quality  
Management in the Department of Defense***

**Approved for public release; distribution is unlimited.**

This report describes a strategy for educating the DoD work force in TQM. The strategy has two objectives. The first is to describe the educational requirements for a TQM awareness program for managers that provides them with an overview of TQM principles and concepts. The second is to describe program goals, guidelines, and resources available to DoD training developers and managers who will subsequently be responsible for follow-on education.

The report recommends that the Defense Council on Integrity and Management Improvement (DCIMI) take on overall responsibility for this education program and determine which committees and/or boards will carry out actions related to the effort.

**AP 89-1**  
**October 1988**

C. C. Scheifers  
T. M. I. Yellen  
D. Hanson

***Project Profiles***

**Approved for public release; distribution is unlimited.**

This publication provides an introduction to the Center's research and development program. It contains overview information on the organization, reporting relationships, history, mission, functions, operating philosophy, funding, personnel staff composition, and facilities.

Brief one-page descriptions of selected research and development projects are the main feature of this publication. Research and development functions, product line descriptions, on-site research applications, and data bases are identified.

**AP 89-2**  
**October 1988**

C. C. Scheifers  
T. M. I. Yellen

***NPRDC Introduction***

**Approved for public release; distribution is unlimited.**

This publication provides an introduction to the Center's research and development program. It contains overview information on the organization, reporting relationships, history, mission, functions, operating philosophy, funding, personnel staff composition, facilities, research and development function and product line descriptions, on-site research applications, and data bases.

**AP 89-4**  
**December 1988**

R. Dalton  
C. C. Scheifers

***Bibliography of Reports and Journal Articles Approved for Public Release: FY88***

**Approved for public release; distribution is unlimited.**

This report lists all technical reports, journal articles, administrative publications, and technical notes that have been approved for public release in FY88. Publications in each category are listed in chronological order under the following areas: manpower, personnel, testing systems,



education and training, organizational systems, human performance, and bibliographies, reviews, and summaries.

**AP 89-6**  
**February 1989**  
**(AD-A206 351)**

R. Dalton  
C. C. Scheifers

***Command History for 1988***

**Approved for public release; distribution is unlimited.**

This report lists NPRDC's mission, functions, organization, CO/TD biographies, key personnel, chronology of 1988 events, history of the Center, resources (financial, personnel, facilities), R&D program, and publications and presentations.

**AP 89-7**  
**March 1989**  
**(AD-A207 553)**

W. E. Montague  
C. C. Scheifers  
(Editors)

***Independent Research and Independent Exploratory Development Programs: FY88 Annual Report***

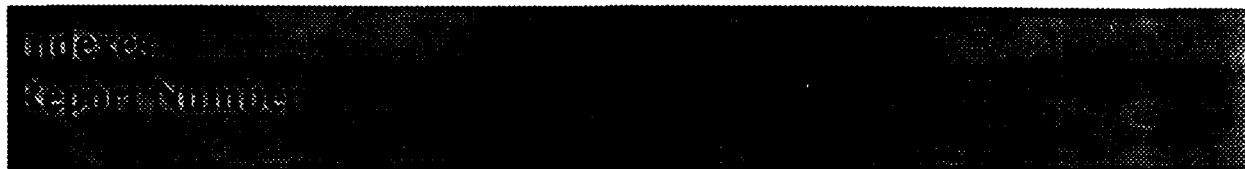
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This report documents the activities and accomplishments of the Independent Research and Independent Exploratory Development programs at NPRDC for FY88. In addition to the technical presentations, program administrative information is provided.



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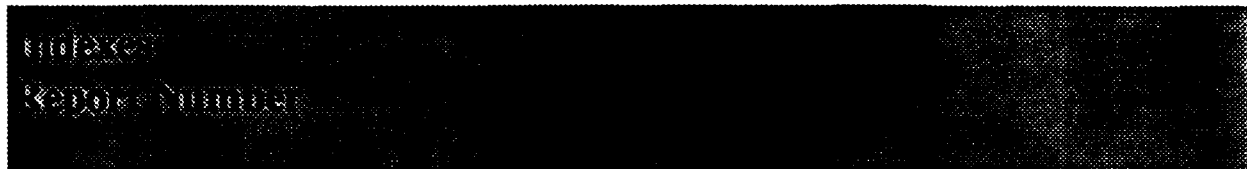
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Superintendent, Naval Postgraduate School  
Superintendent, U.S. Coast Guard Academy (DH)  
Commanding Officer, U.S. Coast Guard Institute  
President, National Defense University (3)  
Director of Research, U.S. Naval Academy  
Commandant, Defense Systems Management College, Ft. Belvoir, VA

### **Courtesy Copy:**

Executive Director, U.S. Naval Institute  
Program Manager, Manpower Research and Advisory Service, Smithsonian Institution  
Institute for Defense Analyses, Science and Technology Division